

## CLAIMS

(74)

We claim:

1. The boost bridge amplifier characterized in that,  
a power supply (1) is connected to mono- or poly-phase load (5),  
5 said load (5) is connected to the appropriate switching bridge (3), and  
said switching bridge (3) is connected to a bridge capacitor (6).

2. The mono-phase boost bridge amplifier of claim 1, wherein  
the first node of said power supply (1) is connected to the first node of the first phase (51) of  
10 said load (5),  
the second node of said power supply (1) is connected to the second node of said switching  
bridge (3) and the second node of said bridge capacitor (6),  
the first node of said bridge capacitor (6) is connected to the first node of said switching  
bridge (3),  
15 the second node of the first phase (51) of said load (5) is connected to the third node of said  
switching bridge (3),  
the first active switch (31) of said switching bridge (3) is connected between the first and  
third nodes of said switching bridge (3),  
the first diode (71) anode is connected to the third node of said switching bridge (3), and the  
20 first diode (71) cathode is connected to the first node of said switching bridge (3),  
the second active switch (32) of said switching bridge (3) is connected between the third and  
second nodes of said switching bridge (3), and  
the second diode (72) anode is connected to the second node of said switching bridge (3),  
and the second diode (72) cathode is connected to the third node of said switching bridge (3).  
25

3. The two-phase boost bridge amplifier of claim 1, wherein  
the first node of said power supply (1) is connected to the first node of the first phase (51) of  
said load (5) and the first node of the second phase (52) of said load (5),  
the second node of said power supply (1) is connected to the second node of said switching  
30 bridge (3) and the second node of said bridge capacitor (6),  
the first node of said bridge capacitor (6) is connected to the first node of said switching  
bridge (3),

the second node of the first phase (51) of said load (5) is connected to the third node of said switching bridge (3),

the second node of the second phase (52) of said load (5) is connected to the fourth node of said switching bridge (3),

5 the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

10 the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3),

15 the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

the third diode (73) anode is connected to the fourth node of said switching bridge (3), and the third diode (73) cathode is connected to the first node of said switching bridge (3),

the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3), and

20 the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3).

4. The three-phase boost bridge amplifier of claim 1, wherein

the first node of said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5), and the first node of the 25 third phase (53) of said load (5),

the second node of said power supply (1) is connected to the second node of said switching bridge (3) and the second node of said bridge capacitor (6),

the first node of said bridge capacitor (6) is connected to the first node of said switching bridge (3),

30 the second node of the first phase (51) of said load (5) is connected to the third node of said switching bridge (3),

the second node of the second phase (52) of said load (5) is connected to the fourth node of said switching bridge (3),

the second node of the third phase (53) of said load (5) is connected to the fifth node of said switching bridge (3),

5 the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3),

the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

the third diode (73) anode is connected to the fourth node of said switching bridge (3), and the third diode (73) cathode is connected to the first node of said switching bridge (3),

the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3),

the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3),

the fifth active switch (35) of said switching bridge (3) is connected between the first and fifth nodes of said switching bridge (3),

the fifth diode (75) anode is connected to the fifth node of said switching bridge (3), and the fifth diode (75) cathode is connected to the first node of said switching bridge (3),

25 the sixth active switch (36) of said switching bridge (3) is connected between the fifth and second nodes of said switching bridge (3), and

the sixth diode (76) anode is connected to the second node of said switching bridge (3), and the sixth diode (76) cathode is connected to the fifth node of said switching bridge (3).

30 5. The boost bridge amplifier characterized in that,

a power supply (1) is connected to mono- or poly-phase load (5),  
said load (5) is connected to the appropriate output filter (4),

1 said output filter (4) is connected to the appropriate switching bridge (3), and  
2 said switching bridge (3) is connected to a bridge capacitor (6).

6. The mono-phase boost bridge amplifier of claim 5, wherein

5 the first node of said power supply (1) is connected to the first node of first phase (51) of said  
load (5),

the second node of said power supply (1) is connected to the second node of said switching  
bridge (3) and the second node of said bridge capacitor (6),

10 the first node of said bridge capacitor (6) is connected to the first node of said switching  
bridge (3),

the second node of the first phase (51) of said load (5) is connected to the first node of first  
filtering inductor (41),

the second node of first filtering inductor (41) is connected to the third node of said  
switching bridge (3),

15 the first active switch (31) of said switching bridge (3) is connected between the first and  
third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the  
first diode (71) cathode is connected to the first node of said switching bridge (3),

20 the second active switch (32) of said switching bridge (3) is connected between the third and  
second nodes of said switching bridge (3), and

the second diode (72) anode is connected to the second node of said switching bridge (3),  
and the second diode (72) cathode is connected to the third node of said switching bridge (3).

7. The two-phase boost bridge amplifier of claim 5, wherein

25 the first node of said power supply (1) is connected to the first node of first phase (51) of said  
load (5) and the first node of the second phase (52) of said load (5),

the second node of said power supply (1) is connected to the second node of said switching  
bridge (3) and the second node of said bridge capacitor (6),

30 the first node of said bridge capacitor (6) is connected to the first node of said switching  
bridge (3),

the second node of first phase (51) of said load (5) is connected to the first node of the first  
filtering inductor (41),

the second node of the first filtering inductor (41) is connected to the third node of said switching bridge (3),

the second node of the second phase (52) of said load (5) is connected to the first node of the second filtering inductor (42),

5 the second node of the second filtering inductor (42) is connected to the fourth node of said switching bridge (3),

the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

10 the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

15 the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3),

the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

20 the third diode (73) anode is connected to the fourth node of said switching bridge (3), and the third diode (73) cathode is connected to the first node of said switching bridge (3),

the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3), and

25 the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3).

8. The three-phase boost bridge amplifier of claim 5, wherein

25 the first node of said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5), and the first node of the third phase (53) of said load (5),

the second node of said power supply (1) is connected to the second node of said switching bridge (3) and the second node of said bridge capacitor (6),

30 the first node of said bridge capacitor (6) is connected to the first node of said switching bridge (3),

the second node of the first phase (51) of said load (5) is connected to the first node of the first filtering inductor (41),

the second node of the first filtering inductor (41) is connected to the third node of said switching bridge (3),

5 the second node of the second phase (52) of said load (5) is connected to the first node of the second filtering inductor (42),

the second node of the second filtering inductor (42) is connected to the fourth node of said switching bridge (3),

the second node of the third phase (53) of said load (5) is connected to the first node of the 10 third filtering inductor (43),

the second node of the third filtering inductor (43) is connected to the fifth node of said switching bridge (3),

the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

15 the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

the second diode (72) anode is connected to the second node of said switching bridge (3),

20 and the second diode (72) cathode is connected to the third node of said switching bridge (3),

the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

the third diode (73) anode is connected to the fourth node of said switching bridge (3), and the third diode (73) cathode is connected to the first node of said switching bridge (3),

25 the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3),

the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3),

30 the fifth active switch (35) of said switching bridge (3) is connected between the first and fifth nodes of said switching bridge (3),

the fifth diode (75) anode is connected to the fifth node of said switching bridge (3), and the fifth diode (75) cathode is connected to the first node of said switching bridge (3),

the sixth active switch (36) of said switching bridge (3) is connected between the fifth and second nodes of said switching bridge (3), and

the sixth diode (76) anode is connected to the second node of said switching bridge (3), and the sixth diode (76) cathode is connected to the fifth node of said switching bridge (3).

5

9. The boost bridge amplifier characterized in that,

a power supply (1) is connected to mono- or poly-phase load (5) and a bridge capacitor (6), said load (5) is connected to the appropriate switching bridge (3), and said switching bridge (3) is connected to said bridge capacitor (6).

10. The mono-phase boost bridge amplifier of claim 9, wherein

the first node of said power supply (1) is connected to the first node of the first phase (51) of said load (5) and the second node of said bridge capacitor (6).

the second node of said power supply (1) is connected to the second node of said switching bridge (3),

the first node of said bridge capacitor (6) is connected to the first node of said switching bridge (3),

the second node of the first phase (51) of said load (5) is connected to the third node of said switching bridge (3),

20 the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and  
25 second nodes of said switching bridge (3), and

the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3).

11. The two-phase boost bridge amplifier of claim 9, wherein

30 the first node of said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5) and the second node of said bridge capacitor (6),

the second node of said power supply (1) is connected to the second node of said switching bridge (3),

the first node of said bridge capacitor (6) is connected to the first node of said switching bridge (3),

5 the second node of the first phase (51) of said load (5) is connected to the third node of said switching bridge (3),

the second node of the second phase (52) of said load (5) is connected to the fourth node of said switching bridge (3),

10 the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

15 the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3),

the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

the third diode (73) anode is connected to the fourth node of said switching bridge (3), and

20 the third diode (73) cathode is connected to the first node of said switching bridge (3),

the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3), and

the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3).

25

12. The three-phase boost bridge amplifier of claim 9, wherein

the first node of said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5), the first node of the third phase (53) of said load (5), and the second node of said bridge capacitor (6),

30 the second node of said power supply (1) is connected to the second node of said switching bridge (3),

the first node of said bridge capacitor (6) is connected to the first node of said switching bridge (3),

the second node of the first phase (51) of said load (5) is connected to the third node of said switching bridge (3),

5 the second node of the second phase (52) of said load (5) is connected to the fourth node of said switching bridge (3),

the second node of the third phase (53) of said load (5) is connected to the fifth node of said switching bridge (3),

10 the first active switch (31) of said switching bridge (3) is connected between the first and third nodes of said switching bridge (3),

the first diode (71) anode is connected to the third node of said switching bridge (3), and the first diode (71) cathode is connected to the first node of said switching bridge (3),

the second active switch (32) of said switching bridge (3) is connected between the third and second nodes of said switching bridge (3),

15 the second diode (72) anode is connected to the second node of said switching bridge (3), and the second diode (72) cathode is connected to the third node of said switching bridge (3),

the third active switch (33) of said switching bridge (3) is connected between the first and fourth nodes of said switching bridge (3),

20 the third diode (73) anode is connected to the fourth node of said switching bridge (3), and the third diode (73) cathode is connected to the first node of said switching bridge (3),

the fourth active switch (34) of said switching bridge (3) is connected between the fourth and second nodes of said switching bridge (3),

the fourth diode (74) anode is connected to the second node of said switching bridge (3), and the fourth diode (74) cathode is connected to the fourth node of said switching bridge (3),

25 the fifth active switch (35) of said switching bridge (3) is connected between the first and fifth nodes of said switching bridge (3),

the fifth diode (75) anode is connected to the fifth node of said switching bridge (3), and the fifth diode (75) cathode is connected to the first node of said switching bridge (3),

30 the sixth active switch (36) of said switching bridge (3) is connected between the fifth and second nodes of said switching bridge (3), and

the sixth diode (76) anode is connected to the second node of said switching bridge (3), and the sixth diode (76) cathode is connected to the fifth node of said switching bridge (3).

13. The mono-phase boost bridge amplifier of claims 5 and 6, wherein  
the first node of the first filtering inductor (41) is connected to the first node of the first  
filtering capacitor (81), and

5 the second node of said bridge capacitor (6) is connected to the second node of the first  
filtering capacitor (81).

14. The two-phase boost bridge amplifier of claims 5 and 7, wherein  
the first node of the first filtering inductor (41) is connected to the first node of the first  
10 filtering capacitor (81),

the second node of said bridge capacitor (6) is connected to the second node of the first  
filtering capacitor (81),

the first node of the second filtering inductor (42) is connected to the first node of the second  
filtering capacitor (82), and

15 the second node of said bridge capacitor (6) is connected to the second node of the second  
filtering capacitor (82).

15. The three-phase boost bridge amplifier of claims 5 and 8, wherein

20 the first node of the first filtering inductor (41) is connected to the first node of the first  
filtering capacitor (81),

the second node of said bridge capacitor (6) is connected to the second node of the first  
filtering capacitor (81),

the first node of the second filtering inductor (42) is connected to the first node of the second  
filtering capacitor (82),

25 the second node of said bridge capacitor (6) is connected to the second node of the second  
filtering capacitor (82),

the first node of the third filtering inductor (43) is connected to the first node of the third  
filtering capacitor (83), and

30 the second node of said bridge capacitor (6) is connected to the second node of the third  
filtering capacitor (83).

16. The two-phase boost bridge amplifier of claims 1, 3, 5, 7, 9, 11 and 14, wherein  
the third node of said switching bridge (3) is connected to the first node of filtering capacitor  
(91),  
the second node of filtering capacitor (91) is connected to the first node of an additional load  
5 (92), and  
the second node of said additional load (92) is connected to the fourth node of said switching  
bridge (3).

17. The mono-phase boost bridge amplifier of claims 1 and 2, wherein  
10 the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5),  
the first node of said power supply (1) is connected to the first node of said switching bridge  
(3) and the first node of said bridge capacitor (6), and  
the second node of said bridge capacitor (6) is connected to the second node of said  
15 switching bridge (3).

18. The two-phase boost bridge amplifier of claims 1 and 3, wherein  
the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5) and the first node of the second phase (52) of said load (5),  
20 the first node of said power supply (1) is connected to the first node of said switching bridge  
(3) and the first node of said bridge capacitor (6), and  
the second node of said bridge capacitor (6) is connected to the second node of said  
switching bridge (3).

25 19. The three-phase boost bridge amplifier of claims 1 and 4, wherein  
the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5), the first node of the second phase (52) of said load (5), and the first node of the  
third phase (53) of said load (5),  
the first node of said power supply (1) is connected to the first node of said switching bridge  
30 (3) and the first node of said bridge capacitor (6), and  
the second node of said bridge capacitor (6) is connected to the second node of said  
switching bridge (3).

20. The mono-phase boost bridge amplifier of claims 5 and 6, wherein  
the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5),

5 the first node of said power supply (1) is connected to the first node of said switching bridge  
(3) and the first node of said bridge capacitor (6), and

the second node of said bridge capacitor (6) is connected to the second node of said  
switching bridge (3).

10 21. The two-phase boost bridge amplifier of claims 5 and 7, wherein

the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5) and the first node of the second phase (52) of said load (5),

the first node of said power supply (1) is connected to the first node of said switching bridge  
(3) and the first node of said bridge capacitor (6), and

15 the second node of said bridge capacitor (6) is connected to the second node of said  
switching bridge (3).

22. The three-phase boost bridge amplifier of claims 5 and 8, wherein

the second node of said power supply (1) is connected to the first node of the first phase (51)  
20 of said load (5), the first node of the second phase (52) of said load (5), and the first node of the  
third phase (53) of said load (5),

the first node of said power supply (1) is connected to the first node of said switching bridge  
(3) and the first node of said bridge capacitor (6), and

25 the second node of said bridge capacitor (6) is connected to the second node of said  
switching bridge (3).

23. The mono-phase boost bridge amplifier of claims 9 and 10, wherein

the second node of said power supply (1) is connected to the first node of the first phase (51)  
of said load (5) and the first node of said bridge capacitor (6),

30 the first node of said power supply (1) is connected to the first node of said switching bridge  
(3), and

the second node of said bridge capacitor (6) is connected to the second node of said switching bridge (3).

24. The two-phase boost bridge amplifier of claims 9 and 11, wherein

5 the second node of said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5) and the first node of said bridge capacitor (6),

the first node of said power supply (1) is connected to the first node of said switching bridge (3), and

10 the second node of said bridge capacitor (6) is connected to the second node of said switching bridge (3).

25. The three-phase boost bridge amplifier of claims 9 and 12, wherein

15 the second node of the said power supply (1) is connected to the first node of the first phase (51) of said load (5), the first node of the second phase (52) of said load (5), the first node of the third phase (53) of said load (5) and the first node of said bridge capacitor (6),

the first node of the said power supply (1) is connected to the first node of said switching bridge (3), and

20 the second node of said bridge capacitor (6) is connected to the second node of said switching bridge (3).

26. The mono-phase boost bridge amplifier of claims 5, 6 and 20, wherein

the first node of the first filtering inductor (41) is connected to the first node of the first filtering capacitor (81), and

25 the first node of said bridge capacitor (6) is connected to the second node of the first filtering capacitor (81).

27. The two-phase boost bridge amplifier of claims 5, 7 and 21, wherein

30 the first node of the first filtering inductor (41) is connected to the first node of the first filtering capacitor (81),

the first node of said bridge capacitor (6) is connected to the second node of the first filtering capacitor (81),

the first node of the second filtering inductor (42) is connected to the first node of the second filtering capacitor (82), and

the first node of said bridge capacitor (6) is connected to the second node of the second filtering capacitor (82).

5

28. The three-phase boost bridge amplifier of claims 5, 8 and 22, wherein

the first node of the first filtering inductor (41) is connected to the first node of the first filtering capacitor (81),

the first node of said bridge capacitor (6) is connected to the second node of the first filtering capacitor (81),

the first node of the second filtering inductor (42) is connected to the first node of the second filtering capacitor (82),

the first node of said bridge capacitor (6) is connected to the second node of the second filtering capacitor (82),

10

the first node of the third filtering inductor (43) is connected to the first node of the third filtering capacitor (83), and

the first node of said bridge capacitor (6) is connected to the second node of the third filtering capacitor (83).

15

29. The two-phase boost bridge amplifier of claims 1, 3, 5, 7, 9, 11, 14, 18, 21, 24 and 27, wherein

the third node of said switching bridge (3) is connected to the first node of the filtering capacitor (91),

20

the second node of said filtering capacitor (91) is connected to the first node of an additional load (92), and

the second node of said additional load (92) is connected to the fourth node of said switching bridge (3).

25

30. The boost bridge amplifier of claims 1, 3, 5, 7, 9, 11, 14, 16, 18, 21, 24, 27 and 29, wherein load (5) is a dual voice coil loudspeaker.

35

31. The boost bridge amplifier of claims 1, 4, 5, 8, 9, 12, 15, 19, 22, 25 and 28, wherein load (5) is a three-phase electric motor.

32. The boost bridge amplifier of claims 2 to 4, 6 to 8, 10 to 31, wherein all active switches are semiconductor switches, such as mosfets, IGBT, bipolar transistors or MCT.

address